The listing of the claims provided below is intended to replace all prior versions and listings of the claims in the application.

LISTING OF THE CLAIMS

1. (Currently Amended) An aeroelastic analysis system for analyzing flutter relating to a completed repair of a structure, the system comprising:

an input module configured to receive one or more input parameters associated with aeroelastic flutter characteristics of a structure, the one or more input parameters relating to a completed repair of the structure; and

a neural network module coupled to the input module, and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic flutter analysis result, the transformation based in part on a trained neural network, wherein the at least one aeroelastic flutter analysis result comprises at least one of a flutter frequency and a flutter speed for ~~may be used to determine~~ determining whether the aeroelastic flutter characteristics of the structure with the completed repair are acceptable.

2. (Currently Amended) The system of claim 1, further comprising an output module coupled to the neural network module, and configured to output the at least one aeroelastic flutter analysis result.

3. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial.

4. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical

connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector.

5. (Original) The system of claim 1, wherein the one or more input parameters comprise:

a weight; and

a location of the weight on the structure.

6. (Original) The system of claim 1, wherein the neural network module comprises:

a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters;

a bias module configured to provide a scalar bias value;

a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias value; and

a transfer function module coupled to the summer and configured to apply a transfer function to the sum.

7. (Original) The system of claim 6, wherein the transfer function comprises a non-linear transfer function.

8. (Original) The system of claim 6 wherein the transfer function comprises a tangent sigmoid function.

9. (Original) The system of claim 6, wherein the transfer function comprises at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function.

10. (Currently Amended) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises [[a]] the flutter frequency at a damping value.

11. (Currently Amended) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises [[a]] the flutter speed at a damping value.

12. (Currently Amended) The system of claim 1, wherein the at least one aeroelastic flutter analyses result comprises [[a]] the flutter frequency and [[a]] the corresponding flutter speed at a damping value.

13. (Currently Amended) The system of claim 1, wherein the at least one aeroelastic flutter analysis result comprises a contour plot of store loads.

14. (Canceled).

15. (Canceled).

16. (Canceled).

17. (Currently Amended) A method of performing aeroelastic flutter analysis to determine the aerolastic flutter characteristics from one or more completed repairs performed on a structure, the method comprising:

determining input parameters relating to one or more completed repairs performed on a structure;

determining a training set of characteristic I/O pairs;

generating a neural network;

training the neural network using the training set to generate a trained neural network;

determining aeroelastic flutter characteristics of the structure based in part on the trained neural network in order to determine at least one of a flutter frequency and a flutter speed of the structure with the one or more completed repairs; and

determining whether the aeroelastic flutter characteristics of the structure with the one or more completed repairs are acceptable.

18. (Currently Amended) The method of claim 17, further comprising determining an accuracy of the aeroelastic flutter characteristics determined using the trained neural network.

19. (Original) The method of claim 17, further comprising:

determining a weight vector in the trained neural network; and

determining a bias value in the trained neural network.

20. (Currently Amended) The method of claim 19, wherein determining the aeroelastic flutter characteristics comprises:

multiplying received input parameters by the weight vector to generate weighted parameters;

summing the weighted parameters and the bias value to generate a summed input; and

applying the summed input to a transfer function associated with a neuron in the trained neural network.

21. (Currently Amended) A method of performing aeroelastic flutter analysis, the method comprising:

receiving at least one input parameter related to a completed repair of an aircraft structure;

applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic flutter analysis result comprising at least one of a flutter frequency and a flutter speed related to the completed repair of the aircraft structure, wherein the aeroelastic flutter analysis result is for determining ~~may be used to determine~~ whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the result.

22. (Original) The method of claim 21, wherein receiving at least one input parameter comprises:

receiving a weight; and

receiving location of the weight on the aircraft structure.

23. (Original) The method of claim 21, wherein applying the predetermined neural network transfer function comprises:

multiplying the at least one input parameter with a weight vector to produce at least one weighted input parameter;

summing together the at least one weighted input parameter and a bias value to generate a summed value; and

applying a neuron transfer function to the summed value.

24. (Currently Amended) The method of claim 21, wherein the aeroelastic flutter analysis result comprises [[a]] the flutter speed at a damping value.

25. (Currently Amended) The method of claim 21, wherein the aeroelastic flutter analysis result comprises [[a]] the flutter frequency at a damping value.

26. (Currently Amended) The method of claim 21, wherein the aeroelastic flutter analysis result comprises [[a]] the flutter speed and [[an]] the associated flutter frequency at a damping value.

27. (Currently Amended) The method of claim 21, wherein the aeroelastic flutter analysis result comprises a contour plot of store loadings.

28. (Currently Amended) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed by a processor instructing the processor to perform the method comprising:

receiving at least one input parameter related to a completed repair of an aircraft structure;

applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic flutter analysis result comprising at least one of a flutter frequency and a flutter speed related to the completed repair of the aircraft structure, wherein the aeroelastic flutter analysis result is for determining ~~may be used to determine~~ whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the result.

29. (Currently Amended) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed be a processor instructing the processor to perform the method comprising:

receiving a mass input related to a completed repair;

receiving a location of the mass on an aircraft structure;

multiplying the mass input and location with a weight vector to produce weighted input parameters;

summing together weighted input parameters and a bias value to generate a summed value;

applying a neuron transfer function to the summed value to generate an aeroelastic flutter analysis ~~flutter~~ result comprising at least one of a flutter frequency and a flutter speed, wherein the aeroelastic flutter analysis ~~flutter~~ result is for determining ~~may be used to determine~~ whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the aeroelastic flutter analysis result.

30. (Currently Amended) An aeroelastic flutter analysis system, the system comprising:

means for receiving input parameters relating to a completed repair of an aircraft structure;

means for applying a neural network transfer function to the input parameters to generate an aeroelastic flutter analysis result, comprising at least one of a flutter frequency and a flutter speed, wherein the aeroelastic flutter analysis result is for determining ~~may be used to determine~~ whether the aircraft structure with the completed repair is acceptable for flight; and

means for outputting the result.

31. (Previously Presented) The system of claim 1, wherein the one or more input parameters relating to a completed repair of the structure relate to a repair performed on an aircraft.

32. (Currently Amended) The system of claim 31, wherein the at least one aeroelastic flutter analysis result is generated after the completed repair is completed and before the aircraft is used for flight.

33. (Previously Presented) The system of claim 1, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

34. (Previously Presented) The system of claim 1, wherein the neural network is a feed forward neural network.

35. (Previously Presented) The system of claim 5, wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters.

36. (Previously Presented) The method of claim 17, wherein the structure is an aircraft.

37. (Currently Amended) The method of claim 36, wherein the step of determining aeroelastic flutter characteristics of the structure based in part on the trained neural network is performed after the completed repair is completed and before the aircraft is used for flight.

38. (Previously Presented) The method of claim 17, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

39. (Previously Presented) The method of claim 17, wherein the neural network is a feed forward neural network.

40. (Previously Presented) The method of claim 17, wherein the step of determining input parameters further comprises:

determining a weight; and

determining a location of the weight relating to the one or more completed repairs performed on the structure.

41. (Previously Presented) The method of claim 40, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

42. (Currently Amended) The method of claim 21, wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

43. (Currently Amended) The processor readable instructions of claim 28, wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

44. (Previously Presented) The processor readable instructions of claim 28, wherein the aircraft structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

45. (Previously Presented) The processor readable instructions of claim 28, wherein the step of receiving the at least one input parameter comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

46. (Previously Presented) The processor readable instructions of claim 45, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

47. (Currently Amended) The processor readable instructions of claim 29, wherein the step of applying the neuron transfer function to the summed value to generate the aeroelastic flutter analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

48. (Currently Amended) The system of claim 30, wherein the neural network transfer function is applied to the input parameters to generate the aeroelastic flutter analysis result after the completed repair is completed and before the aircraft structure is used in flight.

49. (Previously Presented) The system of claim 30, wherein receiving the input parameters comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

50. (Previously Presented) The system of claim 49, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.